Teacher's Scoring Guide

Grade 5
Mathematics

Fall 2007

Indiana Statewide Testing for Educational Progress

49923-W

INTRODUCTION

During the fall of 2007, Indiana students in Grades 3 through 10 participated in the administration of *ISTEP+*. The test for *ISTEP+* Fall 2007 consisted of a multiple-choice section and an applied skills section. For the fall testing, the multiple-choice section was machine-scored. The applied skills section, which consisted of open-ended questions, was hand-scored.

The test results for both the multiple-choice and the applied skills sections were returned to the schools in late November 2007. Copies of student responses to the open-ended questions were returned to the schools in early December 2007. It is the expectation of the Indiana Department of Education that schools will take this opportunity to invite students and parents to sit down with teachers to discuss the results. To support this endeavor, the Indiana Department of Education has prepared the following *Teacher's Scoring Guide*. The purpose of this guide is to help teachers to:

- understand the methods used to score the *ISTEP+* Fall 2007 applied skills section, and
- discuss and interpret these results with students and parents.

In order to use this guide effectively, you will also need the Student Report and a copy of the student's work.

There are three scoring guides for Grade 5, English/Language Arts, Mathematics, and Science. In this Mathematics guide, you will find:

- an introduction,
- a list of the Mathematics Grade 4 Indiana Academic Standards,*
- rubrics (scoring rules) used to score the open-ended questions,
- anchor papers that are actual examples of student work (transcribed in this guide for clarity and ease of reading), and
- descriptions of the ways in which the response meets the rubric criteria for each of the score points.

When you review the contents of the scoring guide, keep in mind that this guide is an overview. If you have questions, write via e-mail (istep@doe.state.in.us) or call the Indiana Department of Education at (317) 232-9050.

* Because *ISTEP+* is administered early in the fall, the Grade 5 test is based on the academic standards through Grade 4.

INTRODUCTION TO THE MATHEMATICS APPLIED SKILLS SECTION

The applied skills section that students responded to this past fall in Grade 5 allowed the students to demonstrate their understanding of Mathematics in a variety of ways, such as using a ruler, explaining a solution, drawing a picture, or interpreting a table or graph.

STRUCTURE

The applied skills section for Grade 5 Mathematics was divided into two tests, Test 7 and Test 8. Each test consisted of seven open-ended questions.

SCORING

Each open-ended question was scored according to its own rubric. A rubric is a description of student performance that clearly articulates the requirements for each of the score points. Scoring rubrics are essential because they ensure that all papers are scored objectively. Each rubric for this administration of the *ISTEP+* Grade 5 Mathematics assessment has a maximum possible score of two or three score points.

NOTE: Images of the questions and student work have been reduced to fit the format of this guide. As a result, figures and diagrams in measurement questions will appear smaller in this guide than in the actual test book.

Rubrics are established prior to testing to describe the performance criteria for each score point. The performance criteria determine the number of score points possible for each question. This process ensures that all responses are judged objectively.

1. Students should not be penalized for omitting:
   - degree symbols
   - dollar signs ($) or cent signs (¢)
   - zeros for place holders; for example, either 0.75 or .750 could be used
   - labels for word problems; for example, *miles*

     NOTE: Students WILL be penalized for use of incorrect labels.
2. Students should not be penalized for:
   - spelling or grammar errors
   - using abbreviations; for example, *ft* or *feet* would be acceptable
3. Students should be given credit for:
   - entries in the workspace that indicate understanding of a complete process even if the response on the answer line is incorrect (i.e., the student would receive partial credit for questions with rubrics that allow for scoring the work)
   - answers not written on the answer line; for example, an answer could be given in the workspace or in the explanation (however, in some cases, because of the multiple calculations in the workspace, placement of an answer on the answer line is necessary to determine which response the student intended). Students WILL be penalized for incorrect answers written on the answer line even if the correct answer appears in the workspace.
4. Students should be given credit for:
   - bar graphs with bars of any width
   - bar graphs with either horizontal or vertical bars
   - circle graphs with data presented in any order
   - line graphs only if lines connect the points

CONDITION CODES

If a response is unscorable, it is assigned one of the following condition codes:

A Blank/No response/Refusal
B Illegible
C Written predominantly in a language other than English
D Insufficient response/Copied from text

MATHEMATICS GRADE 4
INDIANA ACADEMIC STANDARDS

- ❑ **Number Sense**
  Students understand the place value of whole numbers and decimals to two decimal places and how whole numbers and decimals relate to simple fractions.

- ❑ **Computation**
  Students solve problems involving addition, subtraction, multiplication, and division of whole numbers and understand the relationships among these operations. They extend their use and understanding of whole numbers to the addition and subtraction of simple fractions and decimals.

- ❑ **Algebra and Functions**
  Students use and interpret variables, mathematical symbols, and properties to write and simplify numerical expressions and sentences. They understand relationships among the operations of addition, subtraction, multiplication, and division.

- ❑ **Geometry**
  Students show an understanding of plane and solid geometric objects and use this knowledge to show relationships and solve problems.

- ❑ **Measurement**
  Students understand perimeter and area, as well as measuring volume, capacity, time, and money.

- ❑ **Data Analysis and Probability**
  Students organize, represent, and interpret numerical and categorical data and clearly communicate their findings. They show outcomes for simple probability situations.

- ❑ **Problem Solving**
  Students make decisions about how to approach problems and communicate their ideas. Students use strategies, skills, and concepts in finding and communicating solutions to problems. Students determine when a solution is complete and reasonable and move beyond a particular problem by generalizing to other situations.

Problem Solving is identified as a Process Skill in the Indiana Academic Standards. To ensure that the *ISTEP+* questions that assess this Process Skill are grade-appropriate and that the questions use skills that are contained in the standards, these questions are developed by including at least two different indicators from Content Skills in addition to the indicator from the Process Skill. Some of the Content Standards included in the Content Skills are Computation, Geometry, and Algebra. The additional indicators may be from the same or different Content Skills.

The Content Skills used for each of the Process Skill questions in the Grade 5 applied skills section are shown in the following chart.

PROCESS SKILL QUESTIONS

Question	Process Skill	Content Skills *Item may map to more than one indicator in a standard.*
Test 7		
5	Problem Solving	Number Sense, Computation
Test 8		
2	Problem Solving	Measurement, Measurement
3	Problem Solving	Measurement, Data Analysis and Probability
5	Problem Solving	Computation, Measurement
6	Problem Solving	Computation, Algebra and Functions

Test 7—Question 1: Algebra and Functions

1 Linda receives an allowance of $15 each month. She also receives $4 for each hour, h, she spends helping the neighbors. The total amount of money in dollars, x, Linda receives each month can be found by using the formula below.

$$x = 15 + 4h$$

If Linda spent 3 hours helping the neighbors last month, what is the TOTAL amount of money she received for the month?

Show All Work

Answer $ _____

Exemplary Response:

- $27

Sample Process:

- $x = 15 + 4h$
  $= 15 + 4(3)$
  $= \$27$

OR

- Other valid process

Rubric:

2 points	Exemplary response
1 point	Correct complete process; error in computation
0 points	Other

SCORE POINT 2

1 Linda receives an allowance of $15 each month. She also receives $4 for each hour, h, she spends helping the neighbors. The total amount of money in dollars, x, Linda receives each month can be found by using the formula below.

$$x = 15 + 4h$$

If Linda spent 3 hours helping the neighbors last month, what is the TOTAL amount of money she received for the month?

Show All Work

$$\begin{array}{r} 15 \\ +\ 12 \\ \hline 27 \end{array} \qquad \begin{array}{r} 3 \\ \times\ 4 \\ \hline 12 \end{array}$$

Answer $ 27

Test 7—Question 1
Score Point 2

This response matches the exemplary response contained in the rubric. The student gives a correct answer of $27. The response receives a Score Point 2.

SCORE POINT 1

1 Linda receives an allowance of $15 each month. She also receives $4 for each hour, h, she spends helping the neighbors. The total amount of money in dollars, x, Linda receives each month can be found by using the formula below.

$$x = 15 + 4h$$

If Linda spent 3 hours helping the neighbors last month, what is the TOTAL amount of money she received for the month?

Show All Work

$$\begin{array}{r} 4 \\ \times\ 3 \\ \hline 12 \\ +\ 15 \\ \hline \end{array}$$

Answer $ 28

Test 7—Question 1
Score Point 1

This response shows a correct complete process. However, a computation error is made when the student adds 15 and 12, getting 28. Therefore, this response receives a Score Point 1.

Test 7—Question 1
Score Point 0

This response is incorrect. The student adds 15 and 4 without taking into account the 3 hours spent helping the neighbors. Therefore, this response receives a Score Point 0.

SCORE POINT 0

1 Linda receives an allowance of $15 each month. She also receives $4 for each hour, h, she spends helping the neighbors. The total amount of money in dollars, x, Linda receives each month can be found by using the formula below.

$$x = 15 + 4h$$

If Linda spent 3 hours helping the neighbors last month, what is the TOTAL amount of money she received for the month?

Show All Work

$$\begin{array}{r} 15 \\ +\ 4 \\ \hline 19 \end{array}$$

Answer $ 19

Test 7—Question 2: Data Analysis and Probability

2 A computer program counts the number of times different letters of the alphabet appear in a book. The results for some letters are shown in the table below.

Computer Results

Letter	Frequency
A	9,508
E	14,610
I	8,117
O	8,813

What is the difference between the letter that appears the MOST often and the letter that appears the LEAST often?

Show All Work

Answer _____

Exemplary Response:

- 6,493

Sample Process:

- 14,610 − 8,117 = 6,493

OR

- Other valid process

Rubric:

2 points	Exemplary response
1 point	Correct complete process; error in computation
0 points	Other

Test 7—Question 2
Score Point 2

This response matches the exemplary response contained in the rubric. The student gives the correct answer of 6,493. The response receives a Score Point 2.

SCORE POINT 2

2 A computer program counts the number of times different letters of the alphabet appear in a book. The results for some letters are shown in the table below.

Computer Results

Letter	Frequency
A	9,508
E	14,610
I	8,117
O	8,813

What is the difference between the letter that appears the MOST often and the letter that appears the LEAST often?

Show All Work

```
        1
 0   5 0 1
 14,610
- 8,117
 6,493
```

Answer 6,493

SCORE POINT 1

2 A computer program counts the number of times different letters of the alphabet appear in a book. The results for some letters are shown in the table below.

Computer Results

Letter	Frequency
A	9,508
E	14,610
I	8,117
O	8,813

What is the difference between the letter that appears the MOST often and the letter that appears the LEAST often?

Show All Work

0 1 5101
14,610
- 8,117
5,493

Answer 5,493

Test 7—Question 2
Score Point 1

This response shows a correct complete process with an error in computation. The student makes a mistake when subtracting. Therefore, this response receives a Score Point 1.

Test 7—Question 2
Score Point 0

This response is incorrect. The student shows an incorrect process of adding instead of subtracting to find the difference. Therefore, this response receives a Score Point 0.

SCORE POINT 0

2 A computer program counts the number of times different letters of the alphabet appear in a book. The results for some letters are shown in the table below.

Computer Results

Letter	Frequency
A	9,508
E	14,610
I	8,117
O	8,813

What is the difference between the letter that appears the MOST often and the letter that appears the LEAST often?

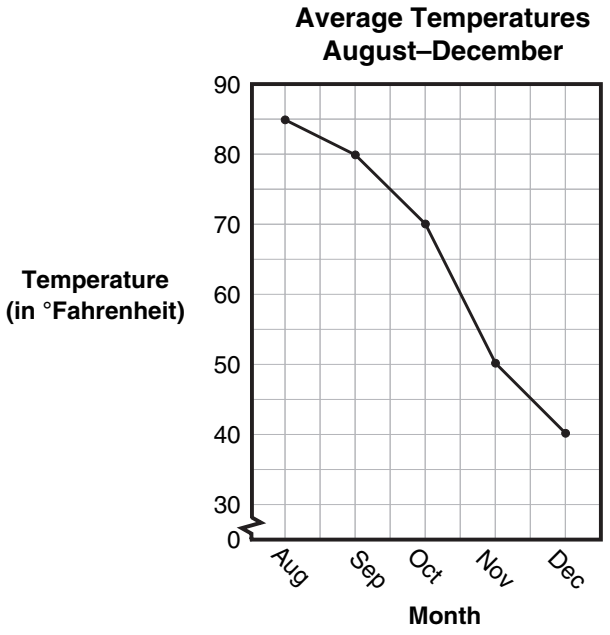
Show All Work

$$\begin{array}{r} 14{,}610 \\ +\ 8{,}117 \\ \hline 22{,}727 \end{array} \qquad 22{,}727$$

Answer 22,727

Test 7—Question 3: Data Analysis and Probability

3 Billy tracked the average monthly temperatures, in degrees Fahrenheit, of his town from August through December. He used his data to create the line graph below.



Between which two months was the change in average temperature the GREATEST?

Show All Work

Answer _____ and _____

Exemplary Response:

- October and November

Sample Process:

- 85 − 80 = 5 (Aug to Sept)
  80 − 70 = 10 (Sept to Oct)
  70 − 50 = 20 (Oct to Nov)
  50 − 40 = 10 (Nov to Dec)
  October to November is the greatest

OR

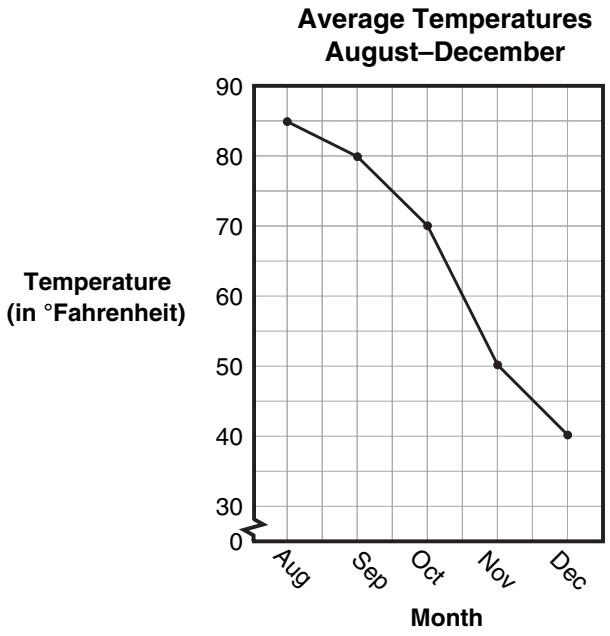
- Other valid process

Rubric:

2 points	Exemplary response
1 point	Correct complete process; error in computation
0 points	Other

SCORE POINT 2

3 Billy tracked the average monthly temperatures, in degrees Fahrenheit, of his town from August through December. He used his data to create the line graph below.



Between which two months was the change in average temperature the GREATEST?

Show All Work

$$\begin{array}{r} 70 \\ -\ 50 \\ \hline 20 \end{array}$$

50 - 40 = 10 85 - 80 = 5 80 - 70 = 10

Answer October and November

Test 7—Question 3
Score Point 2

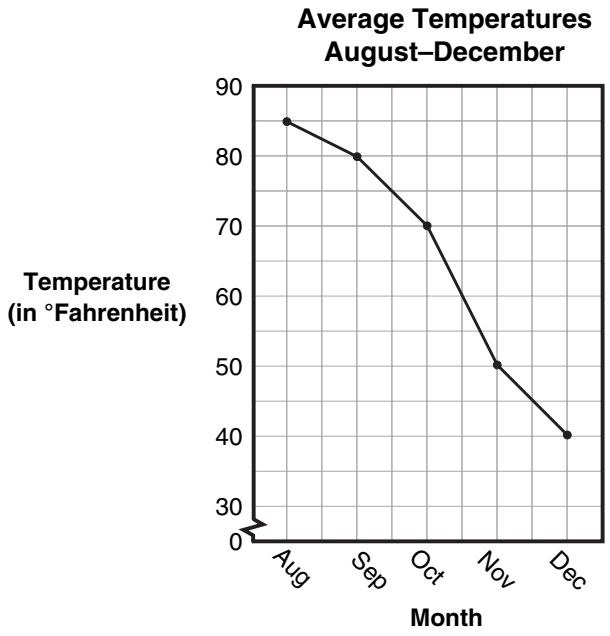
This response matches the exemplary response contained in the rubric. The student gives the correct answers of October and November. The response receives a Score Point 2.

Test 7—Question 3
Score Point 1

This response shows a correct complete process. However, the student gives one correct and one incorrect month. Therefore, this response receives a Score Point 1.

SCORE POINT 1

3 Billy tracked the average monthly temperatures, in degrees Fahrenheit, of his town from August through December. He used his data to create the line graph below.



Between which two months was the change in average temperature the GREATEST?

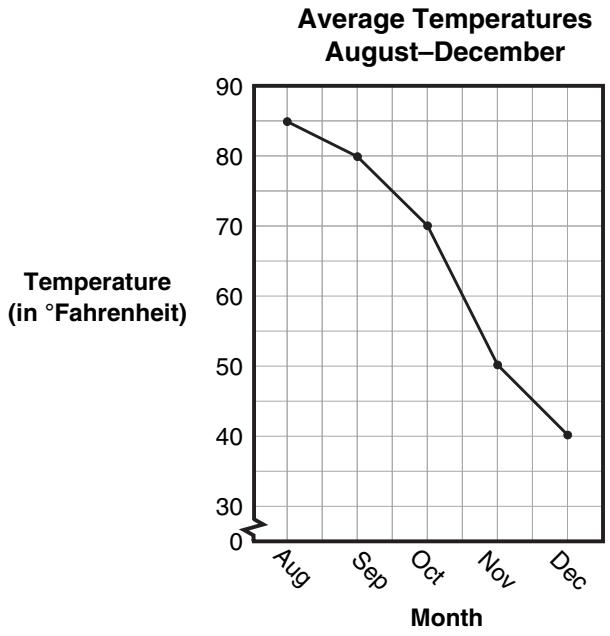
Show All Work

Dec 40 $\frac{10}{-}$ 50
Nov 50 $\frac{20}{-}$ 70
Oct 70 $\frac{10}{-}$ 80
Sep 80 $\frac{5}{-}$ 85

Answer December and November

SCORE POINT 0

3 Billy tracked the average monthly temperatures, in degrees Fahrenheit, of his town from August through December. He used his data to create the line graph below.



Between which two months was the change in average temperature the GREATEST?

Show All Work

90
70
160 F°

Answer August and September

Test 7—Question 3
Score Point 0

This response is incorrect. The student shows an invalid process and gives incorrect answers. Therefore, this response receives a Score Point 0.

Test 7—Question 4: Algebra and Functions

4 Jeremy had 96 marbles. He gave $\frac{1}{2}$ of his marbles to Isaiah. Jeremy took the marbles he had left and then gave $\frac{1}{2}$ of them to Eddie. Jeremy then took the remaining marbles and gave $\frac{1}{2}$ of them to Terrell.

How many marbles does Jeremy have left?

Show All Work

Answer _____ marbles

Exemplary Response:

- 12 marbles

Sample Process:

- $96 \div 2 = 48$
  $48 \div 2 = 24$
  $24 \div 2 = 12$

OR

- Other valid process

Rubric:

2 points	Exemplary response
1 point	Correct complete process; error in computation
0 points	Other

SCORE POINT 2

4 Jeremy had 96 marbles. He gave $\frac{1}{2}$ of his marbles to Isaiah. Jeremy took the marbles he had left and then gave $\frac{1}{2}$ of them to Eddie. Jeremy then took the remaining marbles and gave $\frac{1}{2}$ of them to Terrell.

How many marbles does Jeremy have left?

Show All Work

$$\begin{array}{r} 12 \\ 2\overline{)24} \\ \underline{2} \\ 04 \\ \underline{4} \\ 0 \end{array} \qquad \begin{array}{r} 24 \\ 2\overline{)48} \\ \underline{4} \\ 08 \\ \underline{8} \\ 0 \end{array} \qquad \begin{array}{r} 48 \\ 2\overline{)96} \\ \underline{8} \\ 16 \\ \underline{16} \\ 0 \end{array}$$

Answer 12 marbles

Test 7—Question 4
Score Point 2

This response matches the exemplary response contained in the rubric. The student gives a correct answer of 12 marbles. The response receives a Score Point 2.

SCORE POINT 1

4 Jeremy had 96 marbles. He gave $\frac{1}{2}$ of his marbles to Isaiah. Jeremy took the marbles he had left and then gave $\frac{1}{2}$ of them to Eddie. Jeremy then took the remaining marbles and gave $\frac{1}{2}$ of them to Terrell.

How many marbles does Jeremy have left?

Show All Work

$$\begin{array}{r} 48 \\ 2\overline{)96} \\ \underline{8} \\ 16 \end{array} \qquad \begin{array}{r} 22 \\ 2\overline{)48} \\ \underline{4} \\ 08 \end{array} \qquad \begin{array}{r} 11 \\ 2\overline{)22} \\ \underline{2} \\ 02 \end{array}$$

Answer 11 marbles

Test 7—Question 4
Score Point 1

This response shows a correct complete process with an error in computation. The student makes a mistake when dividing 48 by 2 to get 22. Therefore, this response receives a Score Point 1.

Test 7—Question 4
Score Point 0

This response shows an incorrect process resulting in an incorrect answer. The student subtracts 3 from 96 instead of dividing the number of marbles in half three times. Therefore, this response receives a Score Point 0.

SCORE POINT 0

4 Jeremy had 96 marbles. He gave $\frac{1}{2}$ of his marbles to Isaiah. Jeremy took the marbles he had left and then gave $\frac{1}{2}$ of them to Eddie. Jeremy then took the remaining marbles and gave $\frac{1}{2}$ of them to Terrell.

How many marbles does Jeremy have left?

Show All Work

$$\begin{array}{r} 96 \\ -\ 3 \\ \hline 93 \end{array}$$

Answer 93 marbles

Test 7—Question 5: Problem Solving

5 The sign below shows the costs of items at the carnival Jason visits.

Carnival Costs

Entrance ticket	$5.85
Adventure ride ticket	$1.05
Wild ride ticket	$2.10
Hot dog	$2.95
Soda	$1.70

Jason has only $17.00. He estimates that he will be able to buy an entrance ticket, 2 adventure ride tickets, 2 wild ride tickets, 1 hot dog, and 1 soda.

Is Jason's estimate correct? On the lines below, use estimation and the costs of each part of Jason's plan to explain how you know.

_____

_____

_____

_____

_____

What is the ACTUAL amount of money Jason will spend if he follows his plan?

Show All Work

Answer $ _____

Exemplary Response:

- Yes, Jason will be able to follow his plan. It costs about $6 to get in, $2 for the Adventure ride tickets, $4 for the Wild ride tickets, $3 for the hot dog, and $2 for the soda, which is about $17.00.

OR

- Other valid explanation

AND

- $16.80

AND

- Correct complete process

Sample Process:

- $5.85 + 1.05 + 1.05 + 2.10 + 2.10 + 2.95 + 1.70 = $16.80

OR

- Other valid process

NOTE: Award credit for a correct complete process with an error in computation.

Rubric:

3 points	Exemplary response
2 points	Two correct components
1 point	One correct component
0 points	Other

SCORE POINT 3

5 The sign below shows the costs of items at the carnival Jason visits.

Carnival Costs

Entrance ticket	$5.85
Adventure ride ticket	$1.05
Wild ride ticket	$2.10
Hot dog	$2.95
Soda	$1.70

Jason has only $17.00. He estimates that he will be able to buy an entrance ticket, 2 adventure ride tickets, 2 wild ride tickets, 1 hot dog, and 1 soda.

Is Jason's estimate correct? On the lines below, use estimation and the costs of each part of Jason's plan to explain how you know.

Jason's estimate is correct because 1 Entrance ticket cost $6, 2 Adventure ride ticket cost $2, 2 Wild ride ticket cost $4, 1 Hot Dog cost $3 and 1 soda cost $2 which adds up as $17.

What is the ACTUAL amount of money Jason will spend if he follows his plan?

Show All Work

$$\begin{array}{r} {\scriptstyle 2\ 1} \\ \$5.85 \\ \$2.10 \\ \$4.20 \\ \$2.95 \\ +\ \$1.20 \\ \hline \$16.80 \end{array}$$

Answer $ 16.80

Test 7—Question 5
Score Point 3

This response matches the exemplary response contained in the rubric. The student gives a complete and valid explanation, shows a correct complete process, and gives the correct answer of $16.80. The response receives a Score Point 3.

Test 7—Question 5
Score Point 2

This response shows two correct components. The explanation given does not use estimation to determine if Jason is correct. Therefore, this response receives a Score Point 2.

SCORE POINT 2

5 The sign below shows the costs of items at the carnival Jason visits.

Carnival Costs

Entrance ticket	$5.85
Adventure ride ticket	$1.05
Wild ride ticket	$2.10
Hot dog	$2.95
Soda	$1.70

Jason has only $17.00. He estimates that he will be able to buy an entrance ticket, 2 adventure ride tickets, 2 wild ride tickets, 1 hot dog, and 1 soda.

Is Jason's estimate correct? On the lines below, use estimation and the costs of each part of Jason's plan to explain how you know.

Yes cause He says He can by 1 entrance ticket for $5.85, and 2 adventure ride tickets For $1.05, 2 wild ride tickets for $2.10 a Hot dog and soda that together $4.65 and all together it equals $16.80

What is the ACTUAL amount of money Jason will spend if he follows his plan?

Show All Work

$5.85
$1.05
$1.05
$2.10
$2.10
$2.95
+ $1.70
$16.80

$2.95
+ $1.70
$4.65

Answer $ 16.80

SCORE POINT 1

5 The sign below shows the costs of items at the carnival Jason visits.

Carnival Costs

Entrance ticket	$5.85
Adventure ride ticket	$1.05
Wild ride ticket	$2.10
Hot dog	$2.95
Soda	$1.70

Jason has only $17.00. He estimates that he will be able to buy an entrance ticket, 2 adventure ride tickets, 2 wild ride tickets, 1 hot dog, and 1 soda.

Is Jason's estimate correct? On the lines below, use estimation and the costs of each part of Jason's plan to explain how you know.

Yes that will about $14.00.

What is the ACTUAL amount of money Jason will spend if he follows his plan?

Show All Work

$$\begin{array}{r} {}^{2} \\ \$2.95 \\ 2.10 \\ 4.20 \\ 5.85 \\ 1.70 \\ \hline \$16.70 \end{array}$$

Answer $ 16.70

Test 7—Question 5
Score Point 1

This response shows one correct component. The student shows a correct complete process. However, an error in computation leads to an incorrect answer. The explanation is invalid. Therefore, this response receives a Score Point 1.

Test 7—Question 5
Score Point 0

This response is incorrect. The student gives an incorrect explanation that does not address estimating and does not account for the multiple ride tickets. The student shows an incomplete process that leads to an incorrect answer on the line. Therefore, this response receives a Score Point 0.

SCORE POINT 0

5 The sign below shows the costs of items at the carnival Jason visits.

Carnival Costs

Entrance ticket	$5.85
Adventure ride ticket	$1.05
Wild ride ticket	$2.10
Hot dog	$2.95
Soda	$1.70

Jason has only $17.00. He estimates that he will be able to buy an entrance ticket, 2 adventure ride tickets, 2 wild ride tickets, 1 hot dog, and 1 soda.

Is Jason's estimate correct? On the lines below, use estimation and the costs of each part of Jason's plan to explain how you know.

No, he was higher than it really cost. I added 2 adventure tickets, 2 wild tickets, 1 hotdog, and a soda and it all came to $9.90. He said $17.00 he was high.

What is the ACTUAL amount of money Jason will spend if he follows his plan?

Show All Work

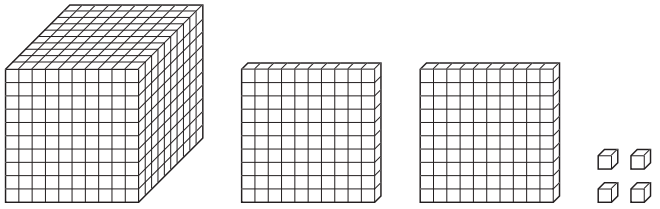
$$\begin{array}{r} {\scriptstyle 1\ 1} \\ \$1.05 \\ \$2.10 \\ \$2.10 \\ \$2.45 \\ \$1.70 \\ \hline 9.90 \end{array}$$

Answer $ $9.90

Test 7—Question 6: Number Sense

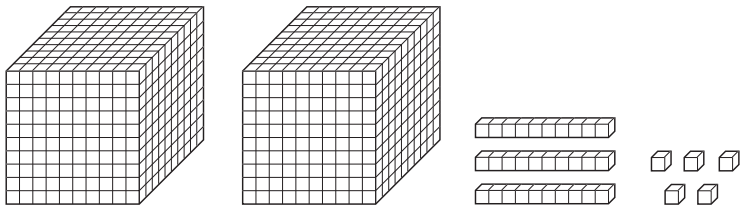
6 What number does the place-value model below represent?

= one



Answer _____

Now look at the second place-value model below.



If the two place-value models were COMBINED, what number would they represent?

Answer _____

Exemplary Response:

- 1,204

AND

- 3,239

NOTE: Award credit for a correct second answer based on an incorrect first answer.

Rubric:

2 points	Exemplary response
1 point	One correct component
0 points	Other

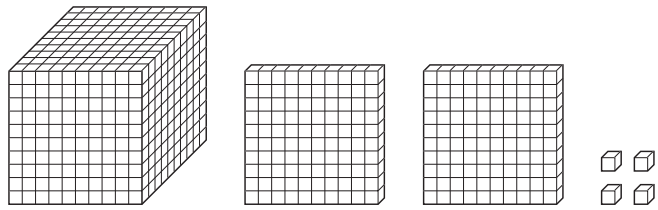
Test 7—Question 6
Score Point 2

This response matches the exemplary response contained in the rubric. The student gives two correct answers. The response receives a Score Point 2.

SCORE POINT 2

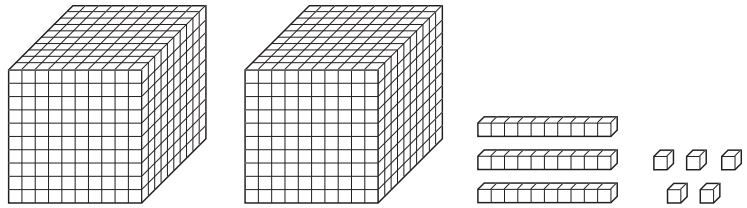
6 What number does the place-value model below represent?

= one



Answer 1,204

Now look at the second place-value model below.



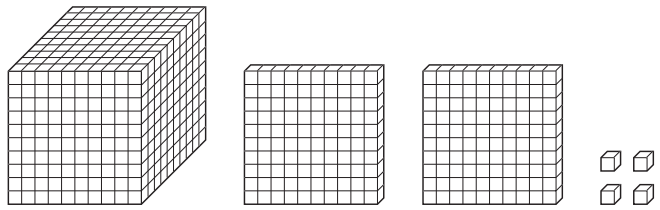
If the two place-value models were COMBINED, what number would they represent?

Answer 3,239

SCORE POINT 1

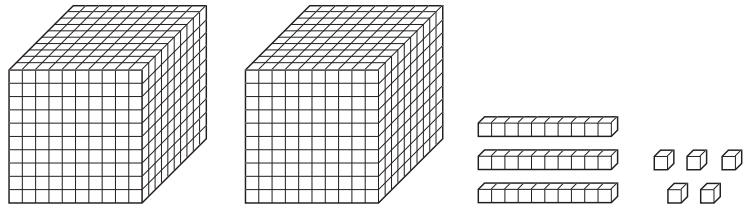
6 What number does the place-value model below represent?

= one



Answer 1,204

Now look at the second place-value model below.



If the two place-value models were COMBINED, what number would they represent?

Answer 2,305

Test 7—Question 6
Score Point 1

This response shows one correct answer. In the second part of the question the student counts the three tens blocks as hundreds and does not combine the two models, leading to an incorrect answer on the line. Therefore, this response receives a Score Point 1.

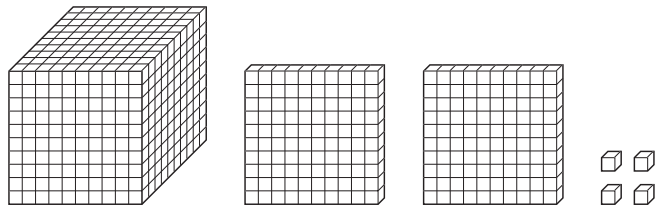
Test 7—Question 6
Score Point 0

This response is incorrect. The student does not differentiate between the values of the thousands, hundreds, and tens blocks. Therefore, this response receives a Score Point 0.

SCORE POINT 0

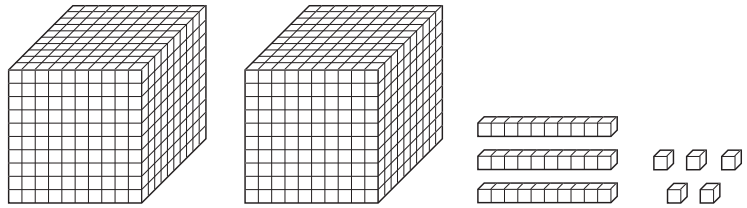
6 What number does the place-value model below represent?

= one



Answer 304

Now look at the second place-value model below.

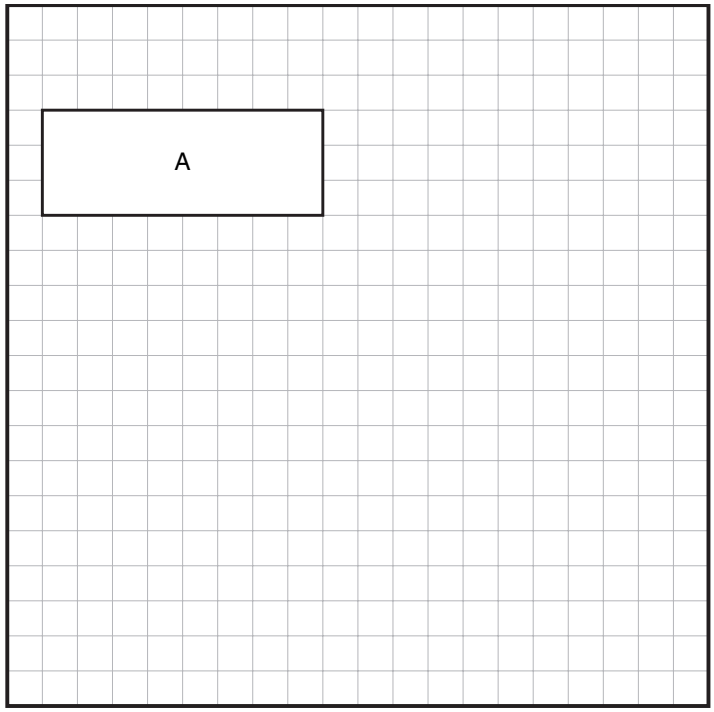


If the two place-value models were COMBINED, what number would they represent?

Answer 539

Test 7—Question 7: Measurement

7 Rectangle A has an area of 24 square units and a perimeter of 22 units. On the grid below, draw another rectangle that has the SAME area but a DIFFERENT perimeter than rectangle A.

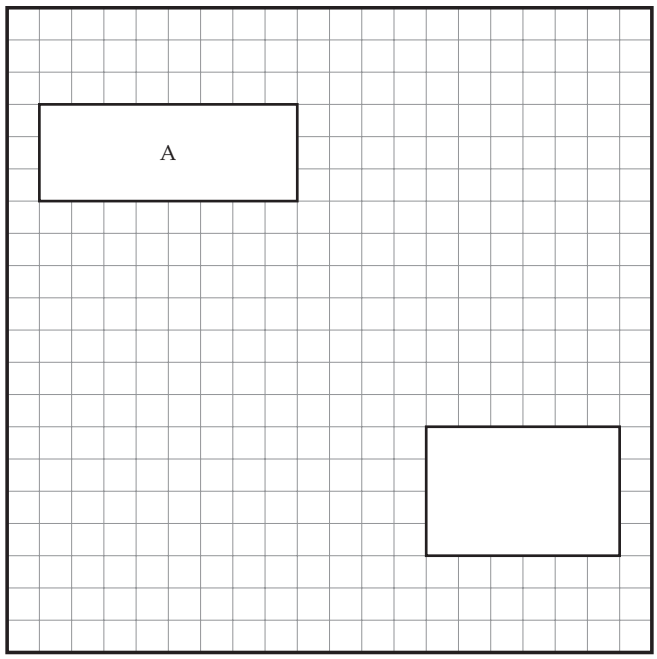


What is the perimeter, in units, of the new rectangle?

Area of rectangle = length × width

Answer _____ units

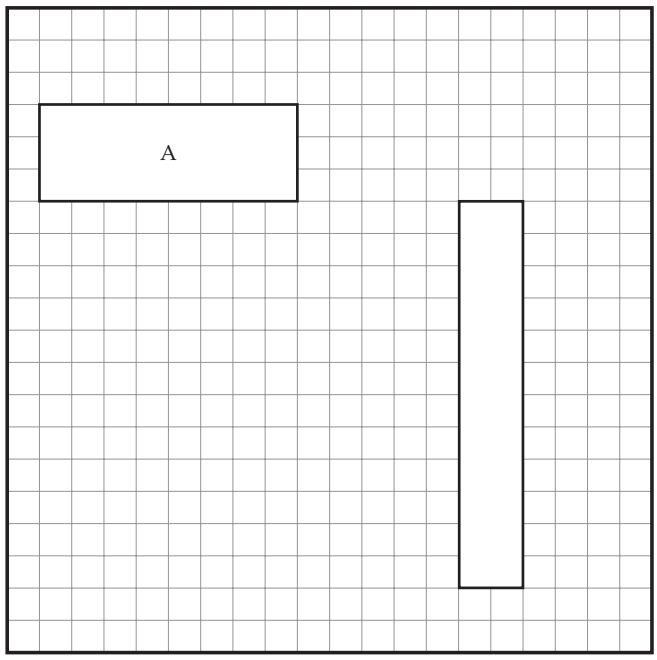
Exemplary Response:

- 

AND

- 20 units

OR

- 

AND

- 28 units

OR

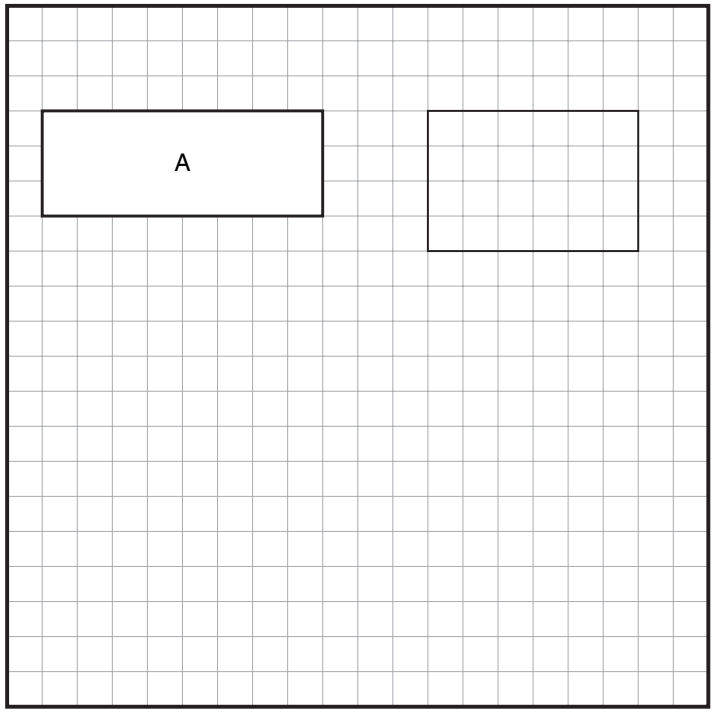
- Other valid response

Rubric:

2 points	Exemplary response
1 point	One correct component
0 points	Other

SCORE POINT 2

7 Rectangle A has an area of 24 square units and a perimeter of 22 units. On the grid below, draw another rectangle that has the SAME area but a DIFFERENT perimeter than rectangle A.



What is the perimeter, in units, of the new rectangle?

Area of rectangle = length × width

Answer 20 units

Test 7—Question 7 Score Point 2

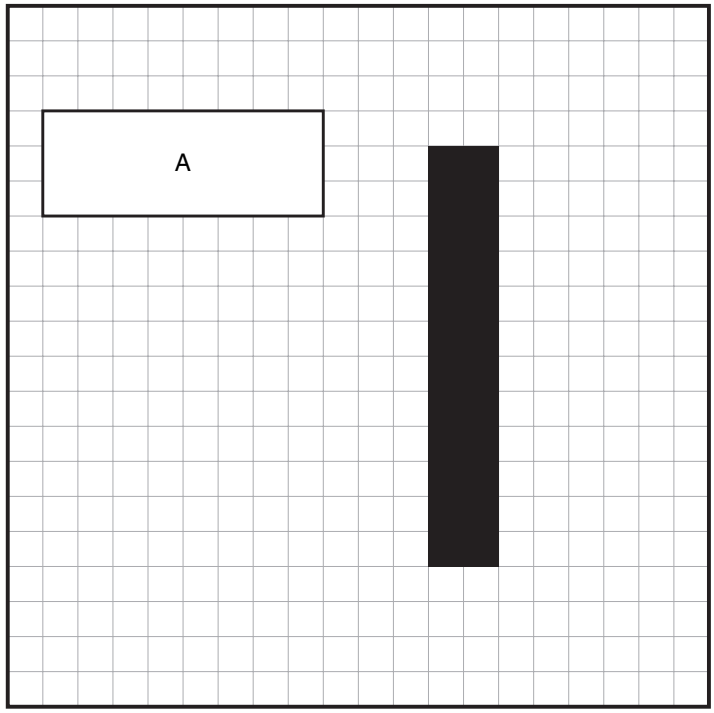
This response matches the exemplary response contained in the rubric. The student correctly draws a rectangle with the same area as the original and a different perimeter than the original and gives a correct perimeter on the answer line. The response receives a Score Point 2.

Test 7—Question 7
Score Point 1

This response shows only one correct component. The student correctly draws a second rectangle. However, the student gives an incorrect perimeter for the new rectangle. Therefore, this response receives a Score Point 1.

SCORE POINT 1

7 Rectangle A has an area of 24 square units and a perimeter of 22 units. On the grid below, draw another rectangle that has the SAME area but a DIFFERENT perimeter than rectangle A.



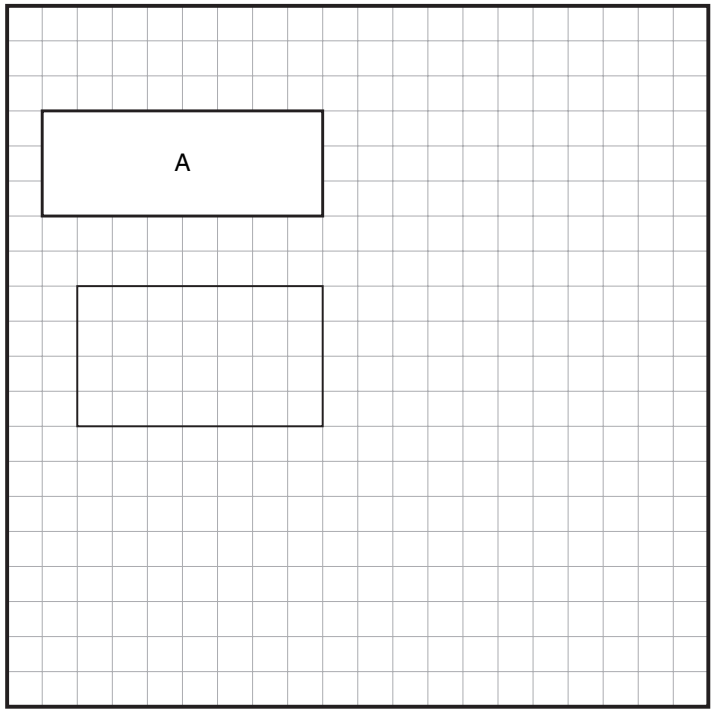
What is the perimeter, in units, of the new rectangle?

Area of rectangle = length × width

Answer 24 units

SCORE POINT 0

7 Rectangle A has an area of 24 square units and a perimeter of 22 units. On the grid below, draw another rectangle that has the SAME area but a DIFFERENT perimeter than rectangle A.



What is the perimeter, in units, of the new rectangle?

Area of rectangle = length × width

Answer 28 units

Test 7—Question 7
Score Point 0

This response is incorrect. The student draws a rectangle with the same perimeter and different area. Therefore, this response receives a Score Point 0.

Test 8—Question 1: Algebra and Functions

1 Maggie slices one loaf of French bread into 16 pieces.

On the line below, write a number sentence to show how many pieces of bread Maggie can slice from 8 loaves of French bread sliced the same way.

Number Sentence _____

If Maggie slices 2 more loaves of French bread the same way, how many TOTAL slices of bread will she have?

Answer _____ slices

Exemplary Response:

- $16 \times 8 = 128$

OR

- Other valid number sentence

AND

- 160 slices

Rubric:

2 points	Exemplary response
1 point	One correct component
0 points	Other

SCORE POINT 2

1 Maggie slices one loaf of French bread into 16 pieces.

On the line below, write a number sentence to show how many pieces of bread Maggie can slice from 8 loaves of French bread sliced the same way.

Number Sentence 8 × 16 = 128

$$\begin{array}{r} {}^{4}16 \\ \times\ 8 \\ \hline 128 \end{array}$$

If Maggie slices 2 more loaves of French bread the same way, how many TOTAL slices of bread will she have?

Answer 160 slices

$$\begin{array}{r} 16 \\ \times\ 10 \\ \hline 160 \end{array}$$

Test 8—Question 1 Score Point 2

This response matches the exemplary response contained in the rubric. The student gives a correct number sentence and the correct answer of 160 slices. The response receives a Score Point 2.

SCORE POINT 1

1 Maggie slices one loaf of French bread into 16 pieces.

On the line below, write a number sentence to show how many pieces of bread Maggie can slice from 8 loaves of French bread sliced the same way.

Number Sentence 16 × 8 = 128

If Maggie slices 2 more loaves of French bread the same way, how many TOTAL slices of bread will she have?

Answer 144 slices

Test 8—Question 1 Score Point 1

This response shows one correct component. The student does not give a correct answer on the line. Therefore, this response receives a Score Point 1.

Test 8—Question 1
Score Point 0

This response is incorrect. The student gives an invalid number sentence and shows an incorrect answer on the line. Therefore, this response receives a Score Point 0.

SCORE POINT 0

1 Maggie slices one loaf of French bread into 16 pieces.

On the line below, write a number sentence to show how many pieces of bread Maggie can slice from 8 loaves of French bread sliced the same way.

Number Sentence 8 ÷ 16 = 2

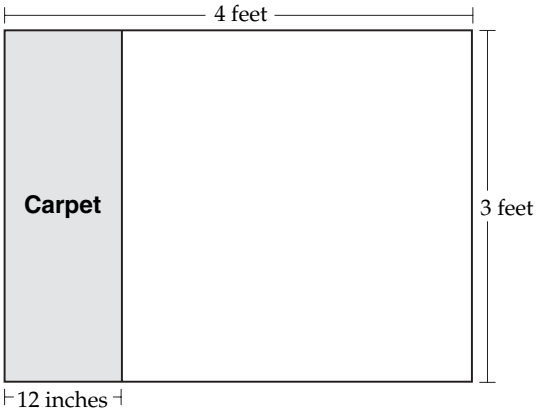
If Maggie slices 2 more loaves of French bread the same way, how many TOTAL slices of bread will she have?

Answer 32 slices

Test 8—Question 2: Problem Solving

2 Marion used a piece of carpet 12 inches long and 3 feet wide to cover part of a doghouse floor. The diagram below shows the piece of carpet and the rest of the doghouse floor.

Doghouse Floor



What is the area, in square FEET, of the doghouse floor that still needs to be covered?

Area of rectangle = length × width

Show All Work

Answer _____ square feet

Exemplary Response:

- 9 square feet

AND

- Correct complete process

Sample Process:

- 1 foot $=$ 12 inches

  4 feet $-$ 1 foot $=$ 3 feet

  3 feet $\times$ 3 feet $=$ 9 square feet

OR

- Other valid process

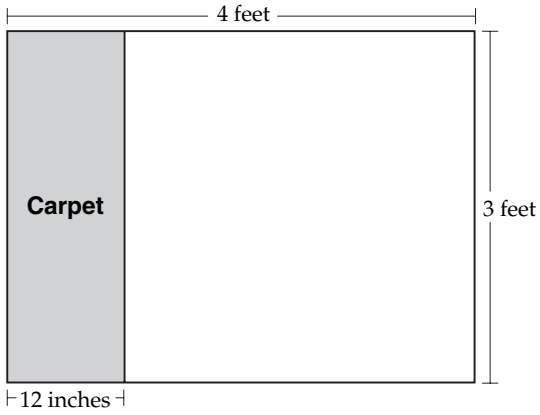
Rubric:

2 points	Exemplary response
1 point	Correct answer only OR Correct complete process; error in computation
0 points	Other

SCORE POINT 2

2 Marion used a piece of carpet 12 inches long and 3 feet wide to cover part of a doghouse floor. The diagram below shows the piece of carpet and the rest of the doghouse floor.

Doghouse Floor



What is the area, in square FEET, of the doghouse floor that still needs to be covered?

Area of rectangle = length × width

Show All Work

$$\begin{array}{r} 4 \text{ ft.} \\ -\ 1 \text{ ft.} \\ \hline 3 \text{ ft.} \end{array} \qquad \begin{array}{r} 3 \\ \times\ 3 \\ \hline 9 \end{array}$$

Answer 9 square feet

Test 8—Question 2
Score Point 2

This response matches the exemplary response contained in the rubric. The student shows a correct complete process and gives the correct answer of 9 square feet. The response receives a Score Point 2.

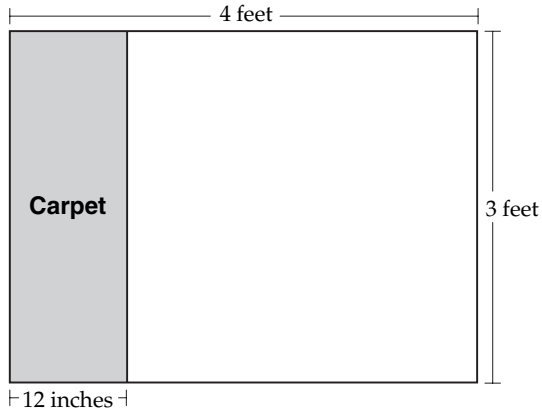
Test 8—Question 2
Score Point 1

This response shows a correct answer. However, no process is shown. Therefore, this response receives a Score Point 1.

SCORE POINT 1

2 Marion used a piece of carpet 12 inches long and 3 feet wide to cover part of a doghouse floor. The diagram below shows the piece of carpet and the rest of the doghouse floor.

Doghouse Floor



What is the area, in square FEET, of the doghouse floor that still needs to be covered?

Area of rectangle = length × width

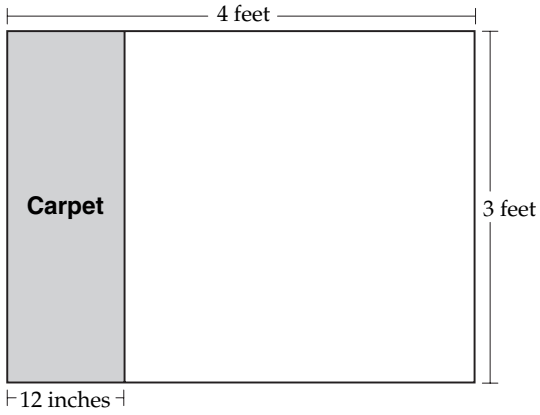
Show All Work

Answer 9 square feet

SCORE POINT 0

2 Marion used a piece of carpet 12 inches long and 3 feet wide to cover part of a doghouse floor. The diagram below shows the piece of carpet and the rest of the doghouse floor.

Doghouse Floor



What is the area, in square FEET, of the doghouse floor that still needs to be covered?

Area of rectangle = length × width

Show All Work

$$\begin{array}{r} 8 \\ +\ 6 \\ \hline 14 \end{array}$$

Answer 14 square feet

Test 8—Question 2 Score Point 0

This response is incorrect. The student uses an incorrect process, finding the total perimeter of the doghouse floor instead of finding the area left to be covered. Therefore, this response receives a Score Point 0.

Test 8—Question 3: Problem Solving

3 Jill goes to the grocery store to buy snack food. The frequency table below shows four snack foods, the cost of each, and how many people bought each food the day Jill went to the store.

Snack Foods

Type of Food	Cost	Number of Times Bought
Bag of granola	$3.99	1
Bag of fruit snacks	$1.66	5
Bag of pretzels	$2.49	6
Bag of cheese sticks	$3.50	3

If Jill wants to buy one bag of the snack food bought MOST FREQUENTLY, how much change would she receive from $10.00?

Show All Work

Answer $ _____

Exemplary Response:

- $7.51

AND

- Correct complete process

Sample Process:

- Most frequent item is bag of pretzels.

$$\begin{array}{r} 10.00 \\ -\ 2.49 \\ \hline 7.51 \end{array}$$

OR

- Other valid process

Rubric:

2 points	Exemplary response
1 point	Correct answer only OR Correct complete process; error in computation
0 points	Other

Test 8—Question 3
Score Point 2

This response matches the exemplary response contained in the rubric. The student gives the correct answer of $7.51 and gives a correct complete process. The response receives a Score Point 2.

SCORE POINT 2

3 Jill goes to the grocery store to buy snack food. The frequency table below shows four snack foods, the cost of each, and how many people bought each food the day Jill went to the store.

Snack Foods

Type of Food	Cost	Number of Times Bought
Bag of granola	$3.99	1
Bag of fruit snacks	$1.66	5
Bag of pretzels	$2.49	6
Bag of cheese sticks	$3.50	3

If Jill wants to buy one bag of the snack food bought MOST FREQUENTLY, how much change would she receive from $10.00?

Show All Work

09 9 10
$10.00
- 2.49
$ 7.51

Answer $ $7.51

SCORE POINT 1

3 Jill goes to the grocery store to buy snack food. The frequency table below shows four snack foods, the cost of each, and how many people bought each food the day Jill went to the store.

Snack Foods

Type of Food	Cost	Number of Times Bought
Bag of granola	$3.99	1
Bag of fruit snacks	$1.66	5
Bag of pretzels	$2.49	6
Bag of cheese sticks	$3.50	3

If Jill wants to buy one bag of the snack food bought MOST FREQUENTLY, how much change would she receive from $10.00?

Show All Work

09 9 10
$~~10.00~~
- 2.49
8.61

Answer $ 8.61

Test 8—Question 3
Score Point 1

This response shows a correct complete process with an error in computation. The student incorrectly subtracts 4 from 9, getting 6, and also incorrectly subtracts 2 from 9, getting 8. Therefore, this response receives a Score Point 1.

Test 8—Question 3
Score Point 0

This response is incorrect. The student adds all the costs of the snack foods and then finds there is no money left. Therefore, this response receives a Score Point 0.

SCORE POINT 0

3 Jill goes to the grocery store to buy snack food. The frequency table below shows four snack foods, the cost of each, and how many people bought each food the day Jill went to the store.

Snack Foods

Type of Food	Cost	Number of Times Bought
Bag of granola	$3.99	1
Bag of fruit snacks	$1.66	5
Bag of pretzels	$2.49	6
Bag of cheese sticks	$3.50	3

If Jill wants to buy one bag of the snack food bought MOST FREQUENTLY, how much change would she receive from $10.00?

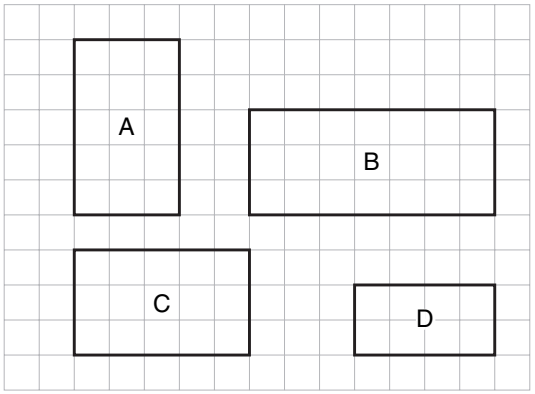
Show All Work

2 2
$3.99
$1.66
$2.46
$3.50
11.61

Answer $ 0.00

Test 8—Question 4: Geometry

4 Look at the four shapes on the grid below.



Which two shapes are congruent?

Answer _____ and _____

On the lines below, explain why the shapes you chose are congruent.

_____

_____

_____

_____

Exemplary Response:

- A and C

AND

- The two rectangles are congruent because they are the same size and shape.

OR

- Other valid response

Rubric:

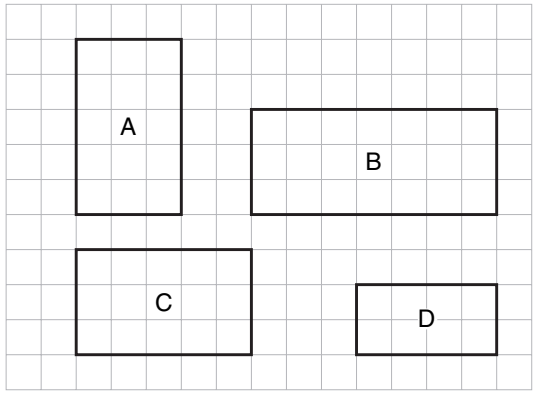
2 points	Exemplary response
1 point	Correct answer only
0 points	Other

Test 8—Question 4
Score Point 2

This response matches the exemplary response contained in the rubric. The student correctly identifies shapes A and C as congruent and gives a valid explanation. The response receives a Score Point 2.

SCORE POINT 2

4 Look at the four shapes on the grid below.



Which two shapes are congruent?

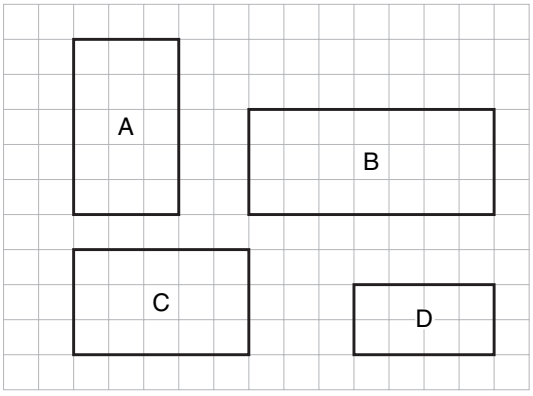
Answer A and C

On the lines below, explain why the shapes you chose are congruent.

A and C are congruent because they are both the same size and shape.

SCORE POINT 1

4 Look at the four shapes on the grid below.



Which two shapes are congruent?

Answer A and C

On the lines below, explain why the shapes you chose are congruent.

They look the same but there shaped a different way.

Test 8—Question 4
Score Point 1

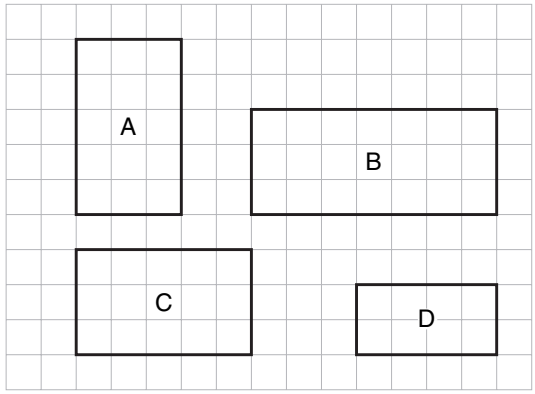
This response correctly identifies the two congruent shapes. However, the explanation of why the shapes selected are congruent is not valid. Therefore, this response receives a Score Point 1.

Test 8—Question 4
Score Point 0

This response is incorrect. The student selects two shapes that are not congruent and then gives an invalid explanation. Therefore, this response receives a Score Point 0.

SCORE POINT 0

4 Look at the four shapes on the grid below.



Which two shapes are congruent?

Answer A and B

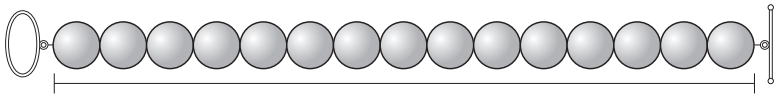
On the lines below, explain why the shapes you chose are congruent.

Because there the same shape and ther Both equl.

Test 8—Question 5: Problem Solving

5 Use your ruler to solve this problem.

Meagan uses beads to make bracelets. The length of each bracelet is shown in the diagram below.



If 3 beads fit onto 1 inch of string, how many beads does Meagan need to make 7 bracelets like the one shown above?

Total number of beads = 3 × number of inches of string

Show All Work

Answer _____ beads

Exemplary Response:

- 105 beads

AND

- Correct complete process

Sample Process:

- bracelet = 5 inches

  5 × 3 = 15

  15 × 7 = 105

OR

- Other valid process

Rubric:

3 points	Exemplary response
2 points	Correct answer only OR Correct complete process; error in computation
1 point	Correct process for finding number of beads for 1 bracelet
0 points	Other

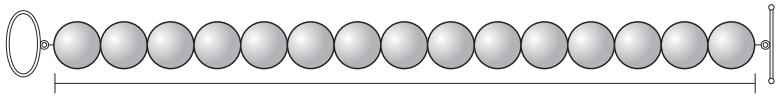
Test 8—Question 5
Score Point 3

This response matches the exemplary response contained in the rubric. The student gives a correct answer of 105 beads and shows a correct complete process. The response receives a Score Point 3.

SCORE POINT 3

5  Use your ruler to solve this problem.

Meagan uses beads to make bracelets. The length of each bracelet is shown in the diagram below.



If 3 beads fit onto 1 inch of string, how many beads does Meagan need to make 7 bracelets like the one shown above?

Total number of beads = 3 × number of inches of string

Show All Work

each bracelet - 5 in.
beads on each bracelet - 3 × 5 = 15
7 bracelets × 15 beads =

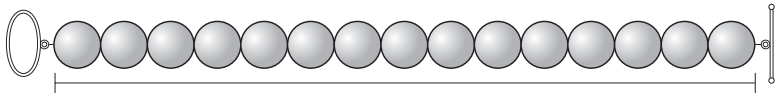
$$\begin{array}{r} {}^{3}15 \\ \times\ 7 \\ \hline 105 \end{array}$$

Answer 105 beads

SCORE POINT 2

5 Use your ruler to solve this problem.

Meagan uses beads to make bracelets. The length of each bracelet is shown in the diagram below.



If 3 beads fit onto 1 inch of string, how many beads does Meagan need to make 7 bracelets like the one shown above?

Total number of beads = 3 × number of inches of string

Show All Work

$$\begin{array}{r} 3 \\ \times\ 5 \\ \hline 15 \end{array} \qquad \begin{array}{r} {\scriptstyle 3}15 \\ \times\ 7 \\ \hline 100 \end{array}$$

Answer 100 beads

Test 8—Question 5 Score Point 2

This response shows a correct complete process with an error in computation. The student correctly measures the bracelet to be 5 inches and correctly determines 15 beads will be needed for one bracelet. However, the student incorrectly multiplies 15 by 7, getting 100. Therefore, this response receives a Score Point 2.

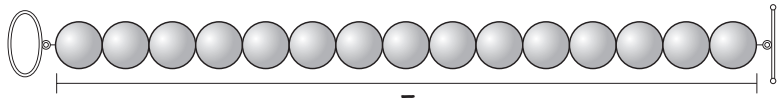
Test 8—Question 5
Score Point 1

This response shows a correct partial process. The student correctly finds the number of beads needed for one bracelet, but does not account for having 7 bracelets. Therefore, this response receives a Score Point 1.

SCORE POINT 1

5 Use your ruler to solve this problem.

Meagan uses beads to make bracelets. The length of each bracelet is shown in the diagram below.



If 3 beads fit onto 1 inch of string, how many beads does Meagan need to make 7 bracelets like the one shown above?

Total number of beads = 3 × number of inches of string

Show All Work

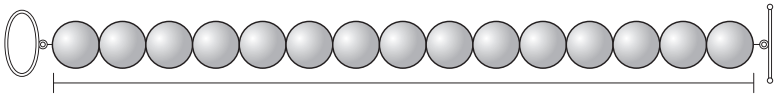
$$\begin{array}{r} 3 \\ \times\ 5 \\ \hline 15 \end{array}$$

Answer 15 beads

SCORE POINT 0

5 Use your ruler to solve this problem.

Meagan uses beads to make bracelets. The length of each bracelet is shown in the diagram below.



If 3 beads fit onto 1 inch of string, how many beads does Meagan need to make 7 bracelets like the one shown above?

Total number of beads = 3 × number of inches of string

Show All Work

$$\begin{array}{r} 3 \\ \times\ 1 \\ \hline 3 \end{array} \qquad \begin{array}{r} 7 \\ \times\ 3 \\ \hline 21 \end{array}$$

Answer 21 beads

Test 8—Question 5
Score Point 0

This response is incorrect. The student shows an invalid process which leads to an incorrect answer. Therefore, this response receives a Score Point 0.

Test 8—Question 6: Problem Solving

6 Marvin used his computer to print 96 book labels. There are 8 labels on each sheet of label paper.

On the line below, write an equation that can be used to find the number of sheets of label paper, p, Marvin used.

Equation _____

When Marvin bought his label paper, he noticed he had two choices. He could buy a package of 10 sheets costing $6 or a package of 15 sheets costing $8. Marvin said he would only have to spend $6 on label paper.

On the lines below, explain how you know if Marvin's statement is correct. Be sure to use values from the question in your explanation.

_____

_____

_____

_____

Exemplary Response:

- $p = 96 \div 8$

OR

- Other valid equation

AND

- No, Marvin could not spend only $6. He used 12 sheets of labels. The $6 package only had 10 sheets. He would have to spend at least $8 for 15 sheets.

OR

- Other valid response

Rubric:

2 points	Exemplary response
1 point	One correct component
0 points	Other

SCORE POINT 2

6 Marvin used his computer to print 96 book labels. There are 8 labels on each sheet of label paper.

On the line below, write an equation that can be used to find the number of sheets of label paper, p, Marvin used.

Equation $96 \div 8 = p$

When Marvin bought his label paper, he noticed he had two choices. He could buy a package of 10 sheets costing $6 or a package of 15 sheets costing $8. Marvin said he would only have to spend $6 on label paper.

On the lines below, explain how you know if Marvin's statement is correct. Be sure to use values from the question in your explanation.

$$\begin{array}{r} 12 \\ 8\overline{)96} \\ -80 \\ \hline 16 \\ -16 \\ \hline 0 \end{array}$$

It is not correct. He would need 12 sheets, and the 10 sheets are not enough. I know because 96 divided by 8 is actually 12. He needs to buy 15 sheets with $8.

Test 8—Question 6
Score Point 2

This response matches the exemplary response contained in the rubric. The student gives a correct equation and a valid explanation stating Marvin would need to spend more than $6. The response receives a Score Point 2.

Test 8—Question 6
Score Point 1

This response shows one correct component. The student gives an incorrect equation. However, the student gives a valid explanation. Therefore, this response receives a Score Point 1.

SCORE POINT 1

6 Marvin used his computer to print 96 book labels. There are 8 labels on each sheet of label paper.

On the line below, write an equation that can be used to find the number of sheets of label paper, p, Marvin used.

Equation 96 × 8 = N

When Marvin bought his label paper, he noticed he had two choices. He could buy a package of 10 sheets costing $6 or a package of 15 sheets costing $8. Marvin said he would only have to spend $6 on label paper.

On the lines below, explain how you know if Marvin's statement is correct. Be sure to use values from the question in your explanation.

His statement is not correct because 10 sheets times
8 labels on each sheet is only 80 labels when he needs
96 labels.

SCORE POINT 0

6 Marvin used his computer to print 96 book labels. There are 8 labels on each sheet of label paper.

On the line below, write an equation that can be used to find the number of sheets of label paper, p, Marvin used.

Equation 96 - 8 = 87

When Marvin bought his label paper, he noticed he had two choices. He could buy a package of 10 sheets costing $6 or a package of 15 sheets costing $8. Marvin said he would only have to spend $6 on label paper.

On the lines below, explain how you know if Marvin's statement is correct. Be sure to use values from the question in your explanation.

It's correct because the package with ten sheets only cost's six dollars.

Test 8—Question 6
Score Point 0

This response is incorrect. The student gives an invalid equation and an invalid explanation. Therefore, this response receives a Score Point 0.

Test 8—Question 7: Measurement

7 Maralee is 3 feet 1 inch tall. She needs to be at least 4 feet tall in order to ride the roller coaster.

How many INCHES taller must Maralee be in order to ride the roller coaster?

Show All Work

Answer _____ inches

Exemplary Response:

- 11 inches

Sample Process:

- 4 ft. − 3 ft. 1 in. = 3 ft. 12 in. − 3 ft. 1 in. = 11 in.

OR

- Other valid process

Rubric:

2 points	Exemplary response
1 point	Correct complete process; error in computation
0 points	Other

SCORE POINT 2

7 Maralee is 3 feet 1 inch tall. She needs to be at least 4 feet tall in order to ride the roller coaster.

How many INCHES taller must Maralee be in order to ride the roller coaster?

Show All Work

$$\begin{array}{r} 48 \\ -\,37 \\ \hline 11 \end{array} \qquad \begin{array}{r} 12 \\ \times\ 3 \\ \hline 36 \end{array} \qquad \begin{array}{r} 12 \\ \times\ 4 \\ \hline 48 \end{array}$$

Answer 11 inches

Test 8—Question 7 Score Point 2

This response matches the exemplary response contained in the rubric. The student gives a correct answer of 11. The response receives a Score Point 2.

SCORE POINT 1

7 Maralee is 3 feet 1 inch tall. She needs to be at least 4 feet tall in order to ride the roller coaster.

How many INCHES taller must Maralee be in order to ride the roller coaster?

Show All Work

$$\begin{array}{r} 2 \\ \times\ \cancel{12} \\ \times\ 3 \\ \hline 36 \text{ in.} \\ +\ 1 \text{ in.} \\ \hline 37 \text{ in.} \end{array} \qquad \begin{array}{r} 12 \\ \times\ 4 \\ \hline 48 \text{ in.} \end{array} \qquad \begin{array}{r} 48 \text{ in.} \\ -\ 31 \text{ in.} \\ \hline 17 \text{ in.} \end{array}$$

Answer 17 inches

Test 8—Question 7 Score Point 1

This response shows a correct complete process with an error in computation. The student subtracts 31 from 48 instead of subtracting 37. Therefore, this response receives a Score Point 1.

Test 8—Question 7
Score Point 0

This response is incorrect. The student gives an incorrect answer and uses an invalid process. Therefore, this response receives a Score Point 0.

SCORE POINT 0

7 Maralee is 3 feet 1 inch tall. She needs to be at least 4 feet tall in order to ride the roller coaster.

How many INCHES taller must Maralee be in order to ride the roller coaster?

Show All Work

```
  3
+ 1
  4
```

Answer 8 inches

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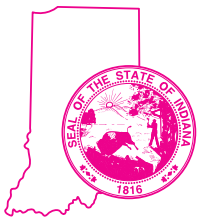

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